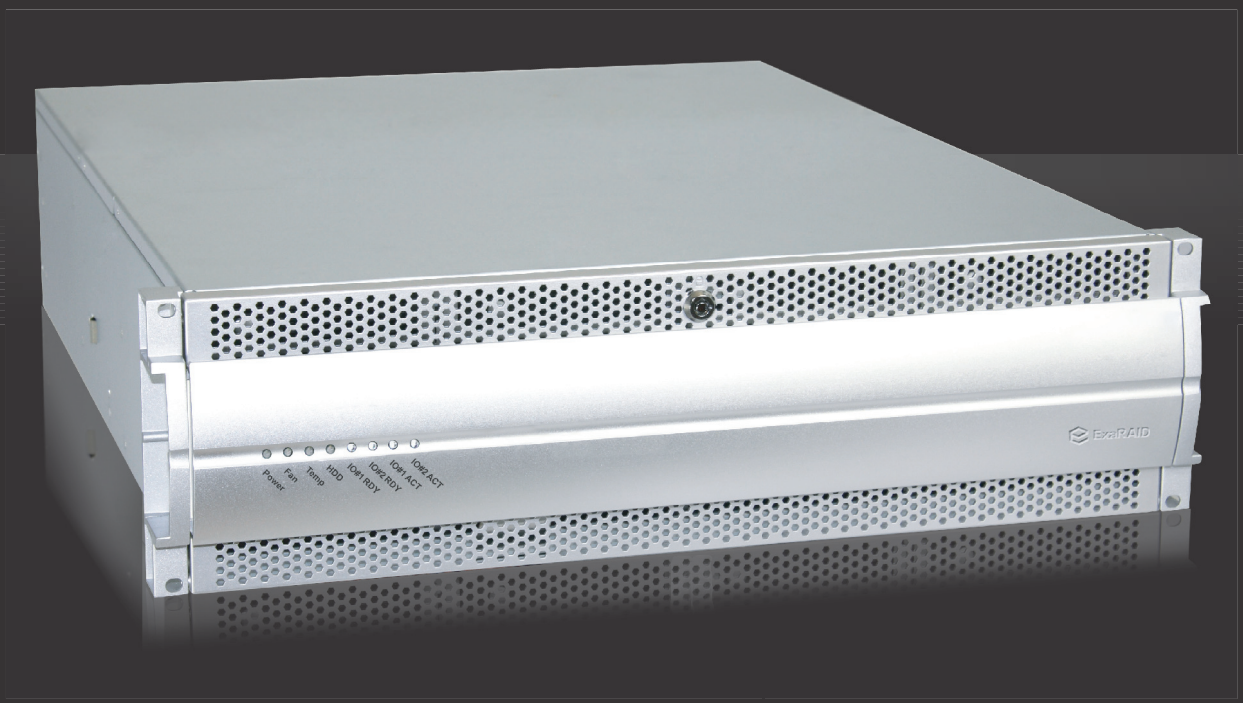
ExaRAID

A12/16/24R/U-SJ
Quick Start Guide

ExaRAID JBOD SYSTEM USER'S GUIDE



Accusys
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A12/16/24R/U-SJ
Quick Start Guide

42-33000-5030

ExaRAID JBOD SYSTEM

Version:1.1

ExaRAID

A16R-SJ JBOD Task List

Step 1: Unpacking the JBOD System below

Step 2: Mounting the JBOD System in a Rack on page 10

Step 3: Installing Disk Drives on page 12

Step 4: Making Connections on page 16

Step 5: Powering on the System on page 19

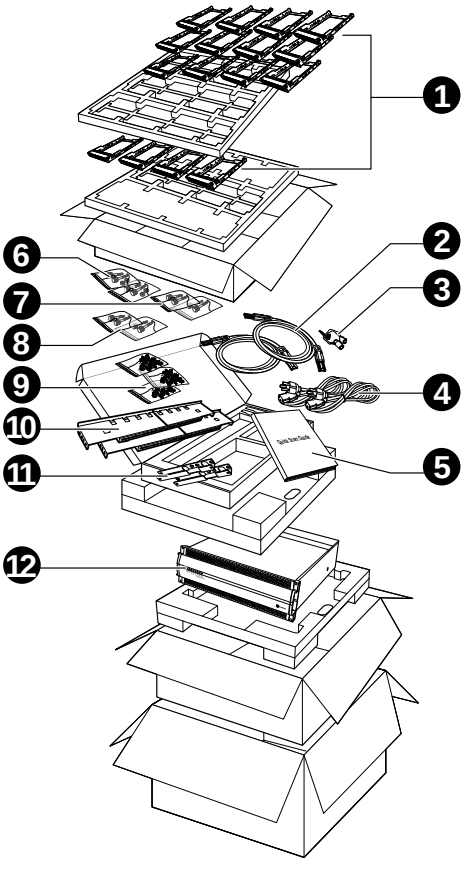
Step 6: Configuring the JBOD system on page 20

Step 7: Host Configuration on page 26

Step 8: Powering Off the System on page 27

Step 1: Unpacking the JBOD System

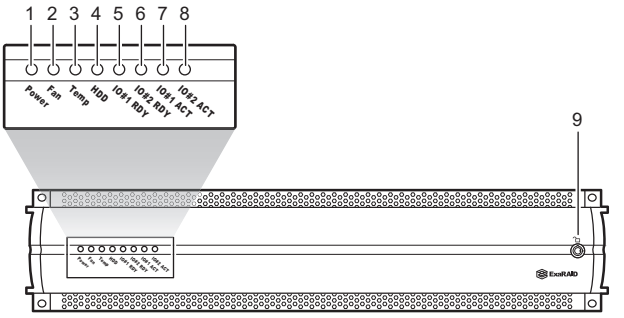
The following items come with the JBOD system package, if any of them is missing or damaged, please contact your supplier:



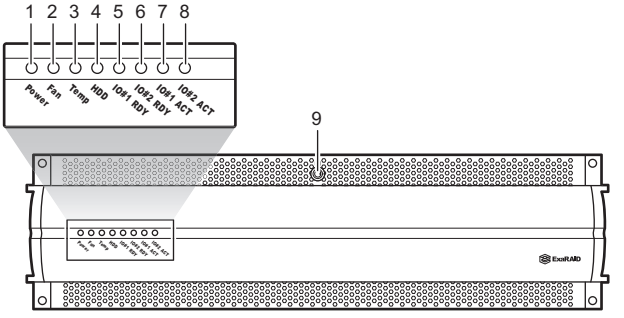
1. Hard disk tray: A12R/U-SJ x 12
   A16R/U-SJ x 16
   A24R/U-SJ x 24
2. SAS cable: A12/A16/A24U-SJ x 1
   A12/A16/A24R-SJ x 2
3. Front panel key x 2
4. Power cable: A12/A16R/U-SJ x 2
   A24R/U-SJ x 3
5. Quick Start Guide
6. M5 fix screw x 2 packs
7. M6 fix screw x 2 packs
8. UNC #10-32 fix screw x 2 packs
9. HDD screw x 3 packs
10. Rail x 1 set
11. Rail extender x 1 set
12. JBOD system

Front Panel View (Closed)

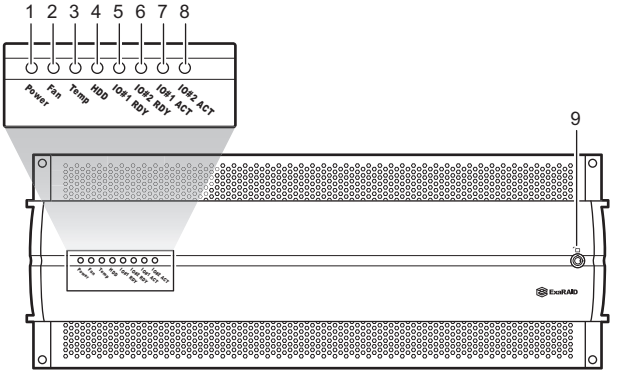
A12R/U-SJ



A16R/U-SJ



A24R/U-SJ

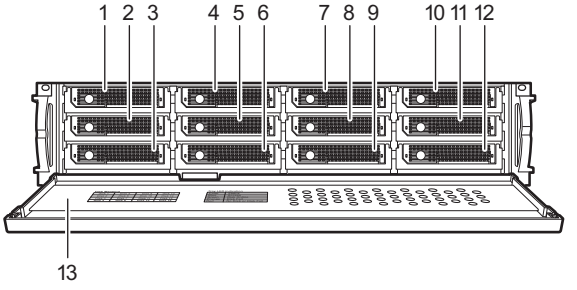


No.	Item	Description
1	Power LED	• Green - Power supplies are installed and working properly. • Red - The JBOD system has a faulty power supply.

No.	Item	Description
2	Fan LED	• Green - Fan modules are installed and working properly. • Red - The JBOD system has a faulty fan module.
3	Temp LED	• Green - The JBOD system temperature is below 55°C. • Red - The JBOD system temperature exceeds 55°C.
4	HDD LED	• Green - All installed disks are working properly. • Red - The JBOD system has a faulty hard disk.
5	IO#1 RDY	Indicates JBOD controller A is working properly.
6	IO#2 RDY	Indicates JBOD controller B is working properly.
7	IO#1 ACT	Indicates data activity in progress between host and JBOD controller A.
8	IO#2 ACT	Indicates data activity in progress between host and JBOD controller B.
9	Lock	Locks the front cover

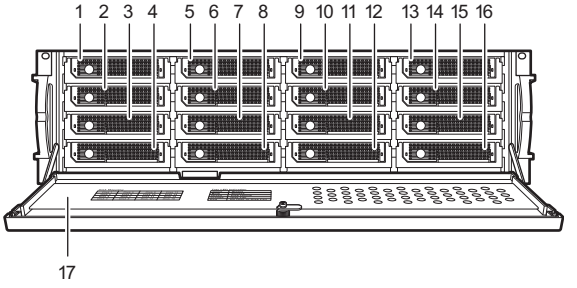
Front Panel View (Open)

A12R/U-SJ



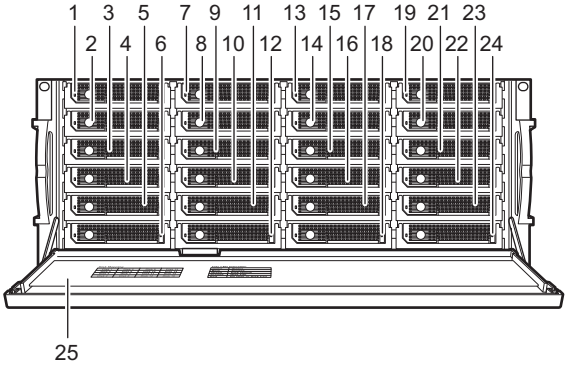
No.	Item	Description
1-12	Disk trays	12 Removal disk trays.
13	Front panel door	Protects the disks.

A16R/U-SJ



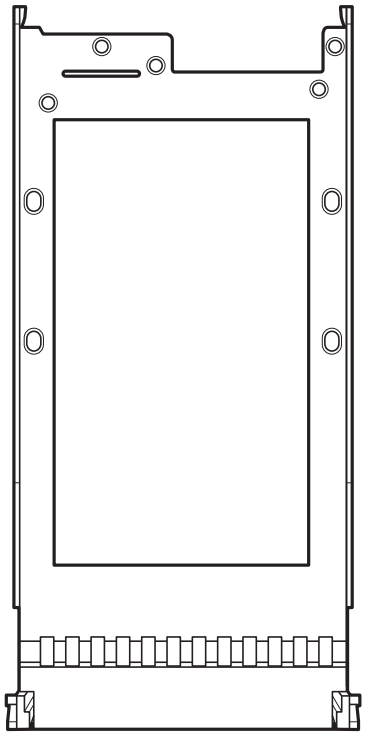
No.	Item	Description
1-16	Disk trays	16 Removal disk trays.
17	Front panel door	Protects the disks.

A24R/U-SJ

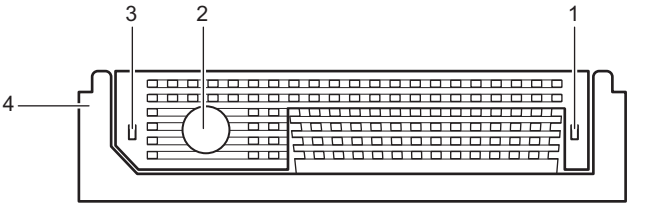


No.	Item	Description
1-24	Disk trays	24 Removal disk trays.
25	Front panel door	Protects the disks.

Disk Tray



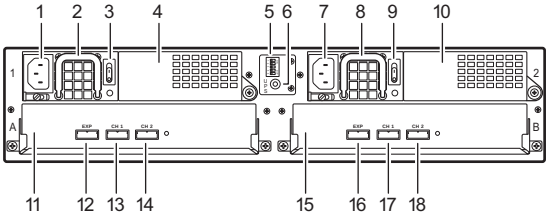
Front View



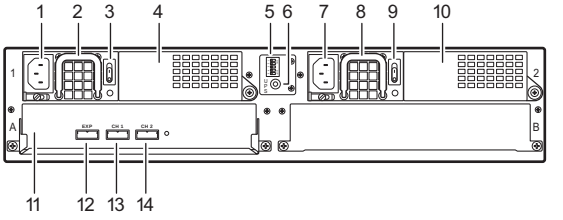
No.	Item	Description
1	Disk LED	• Green - Disk is online • Red - No disk or disk fail
2	Tray button	Press to release the tray handle.
3	Access LED indicator	Lights blue when the disk is being accessed.
4	Tray handle	Use to pull out or lock the disk tray into place.

Rear View

A12R-SJ

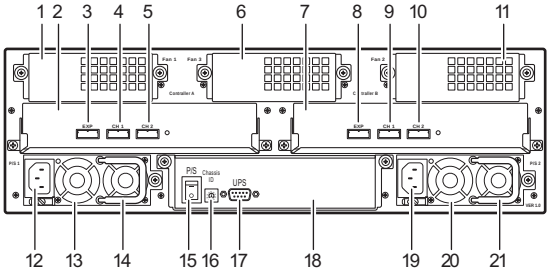


A12U-SJ

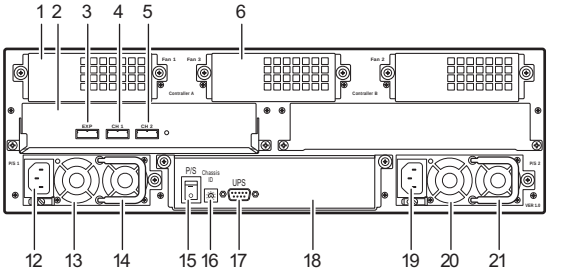


No.	Item	Description
1	AC power port	Connects to the power source.
2	Power supply handle	Use to pull out the power supply.
3	Power supply switch	Use to switch the power on or off.
4	Cooling fan 1	System cooling fan.
5	Chassis ID	Use for JBOD enclosure only, See **Switch ID on page 9**.
6	UPS port	Data port for uninterruptable power supply.
7	AC power port	Connects to the power source.
8	Power supply handle	Use to pull out the power supply.
9	Power supply switch	Use to switch the power on or off.
10	Cooling fan 2	System cooling fan.
11	JBOD Controller A	JBOD controller.
12	Expansion port (Controller A)	Use for JBOD expansion.
13	Host channel 1 (Controller A)	Connects to EXP port on RAID system or SAS HBA card of host.
14	Host channel 2 (Controller A)	Connects to EXP port on RAID system or SAS HBA card of host.
15	JBOD Controller B	JBOD controller.
16	Expansion port (Controller B)	Use for JBOD expansion.
17	Host channel 1 (Controller B)	Connects to EXP port on RAID system or SAS HBA card of host.
18	Host channel 2 (Controller B)	Connects to EXP port on RAID system or SAS HBA card of host.

A16R-SJ

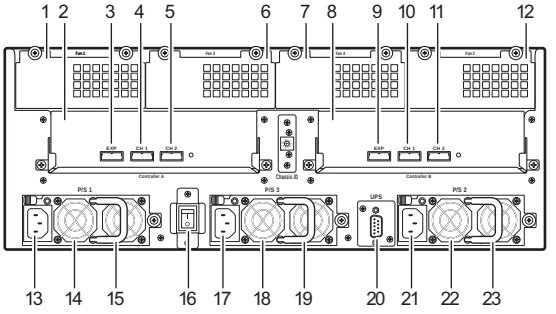


A16U-SJ

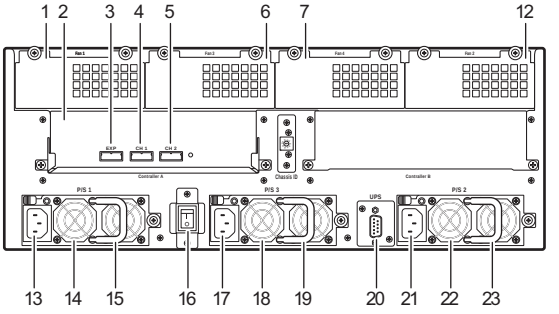


No.	Item	Description
1	Cooling fan 1	System cooling fan.
2	JBOD Controller A	JBOD controller.
3	Expansion port (Controller A)	Use for JBOD expansion.
4	Host channel 1 (Controller A)	Connects to EXP port on RAID system or SAS HBA card of host.
5	Host channel 2 (Controller A)	Connects to EXP port on RAID system or SAS HBA card of host.
6	Cooling fan 3	System cooling fan.
7	JBOD Controller B	JBOD controller.
8	Expansion port (Controller B)	Use for JBOD expansion.
9	Host channel 1 (Controller B)	Connects to EXP port on RAID system or SAS HBA card of host.
10	Host channel 2 (Controller B)	Connects to EXP port on RAID system or SAS HBA card of host.
11	Cooling fan 2	System cooling fan.
12	AC power port	Connects to the power source.
13	Power supply 1	Removable power supply.
14	Power supply handle	Use to pull out the power supply.
15	Power supply switch	Use to switch the power on or off.
16	Chasis ID switch	Use for JBOD enclosure only.
17	UPS port	Data port for uninterruptable power supply.
18	IO tray	Holds the IO board and BBMs.
19	AC power port	Connects to the power source.
20	Power supply 2	Removable power supply.
21	Power supply handle	Use to pull out the power supply.

A24R-SJ



A24U-SJ



No.	Item	Description
1	Cooling fan 1	System cooling fan.
2	JBOD Controller A	JBOD controller.
3	Expansion port (Controller A)	Use for JBOD expansion.
4	Host channel 1 (Controller A)	Connects to EXP port on RAID system or SAS HBA card of host.
5	Host channel 2 (Controller A)	Connects to EXP port on RAID system or SAS HBA card of host.
6	Cooling fan 3	System cooling fan.
7	Cooling fan 4	System cooling fan.
8	JBOD Controller B	JBOD controller.
9	Expansion port (Controller B)	Use for JBOD expansion.
10	Host channel 1 (Controller B)	Connects to EXP port on RAID system or SAS HBA card of host.
11	Host channel 2 (Controller B)	Connects to EXP port on RAID system or SAS HBA card of host.
12	Cooling fan 2	System cooling fan.
13	AC power port	Connects to the power source.
14	Power supply 1	Removable power supply.
15	Power supply handle	Use to pull out the power supply.
16	Power supply switch	Use to switch the power on or off.
17	AC power port	Connects to the power source.
18	Power supply 3	Removable power supply.
19	Power supply handle	Use to pull out the power supply.
20	UPS port	Data port for uninterruptable power supply.
21	AC power port	Connects to the power source.

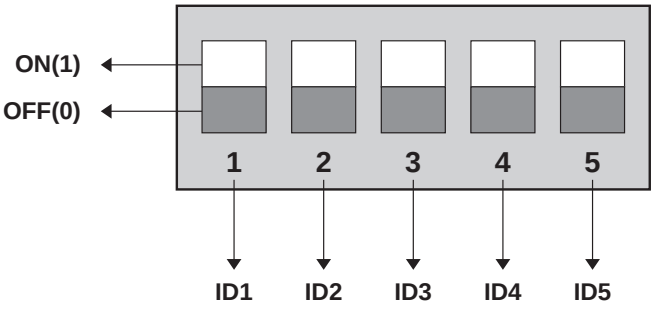
No.	Item	Description
22	Power supply 2	Removable power supply.
23	Power supply handle	Use to pull out the power supply.

Switch ID

See table below on how to set the Chassis ID.

2U-12R/U Chassis ID

ID1(A3)	ID2(A2)	ID3(A1)	ID4(A0)	ID5	Chassis ID	FC-HDD Speed	Remark
				0		2G	
				1		4G	
0	0	0	0		0		
0	0	0	1		1		
0	0	1	0		2		
0	0	1	1		3		
0	1	0	0		4		
0	1	0	1		5		
0	1	1	0		6		
0	1	1	1		7		
1	0	0	0		8		N/A
1	0	0	1		9		N/A

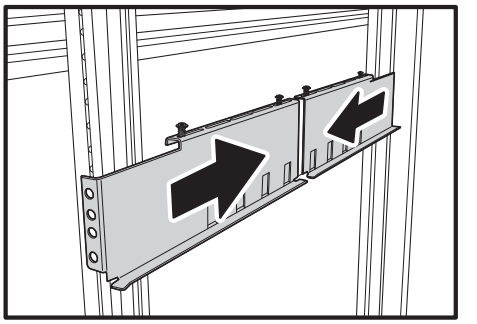


Step 2: Mounting the JBOD System in a Rack

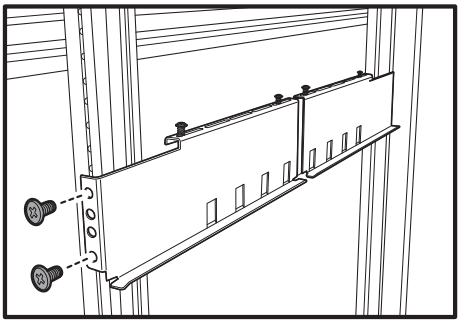
The JBOD system can be installed in a standard 19-inch rack. Follow the procedures below:

1.Attack eight rack nuts into the rack, making sure that they correspond with the mounting points on the rails.

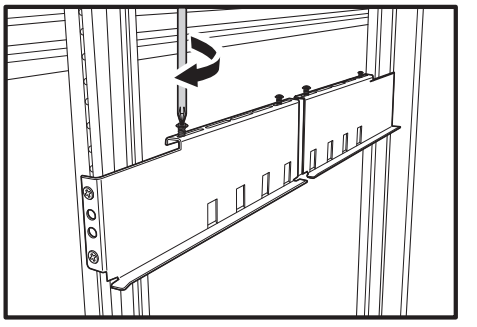
2.Adjust the length of the rails as needed.



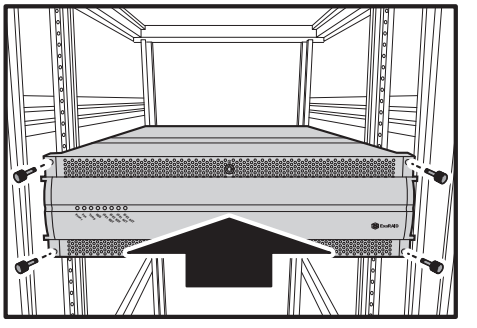
3.Secure the rails using two nuts and bolts on both the front and back posts of the rack.



4.Tighten the locking screws.



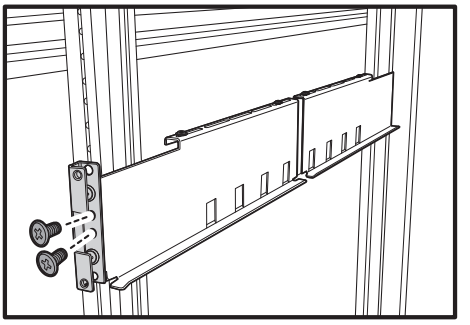
5.Slide the JBOD system into the rack and secure it into place using the fixing screws.



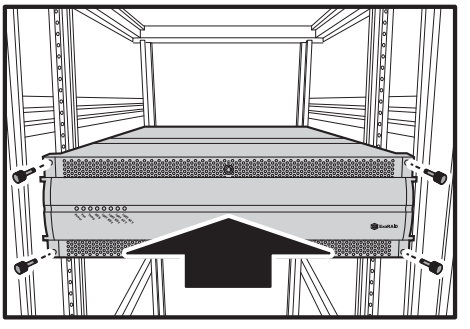
Using the Rail Extenders

Follow the procedures below to install the rail extenders:

1.Install the rail extenders and attach the screws to secure them.



2.Slide the RAID system into the rack and secure it into place using the fixing screws.



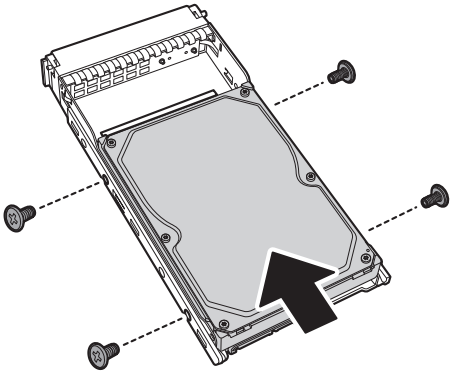
Step 3: Installing Disk Drives

The JBOD system supportS SAS or SATA interface hard drives.

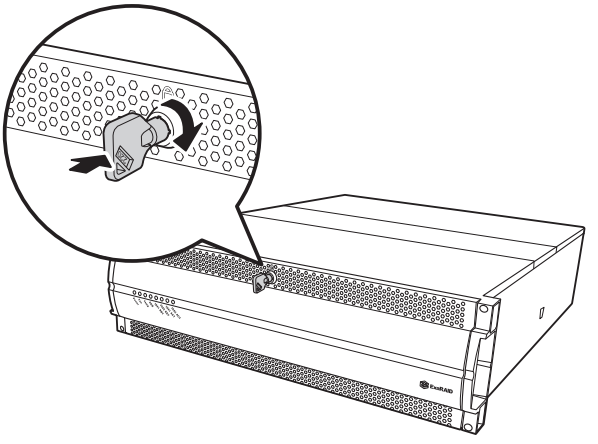
SAS hard disks

Follow the procedures below to install SAS hard drives:

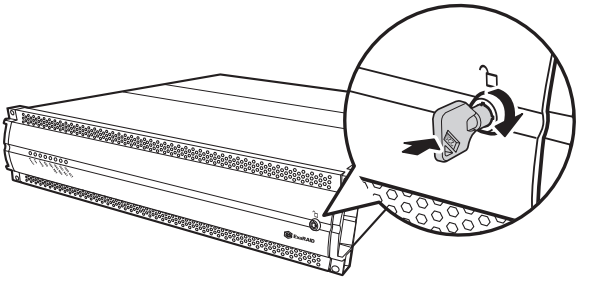
1.Insert the SAS hard drive into the hard disk tray. Screw the sides to secure the hard disk. Repeat this procedure to install more hard disks.



2.Insert the key to the key slot and turn to unlock the front panel door.

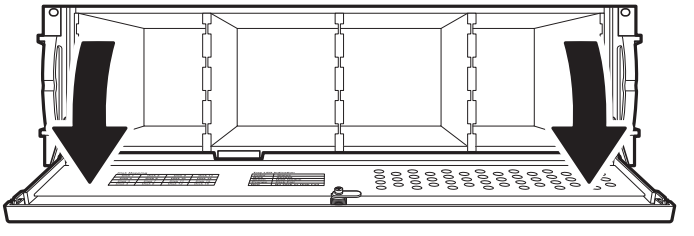


A16R-SJ

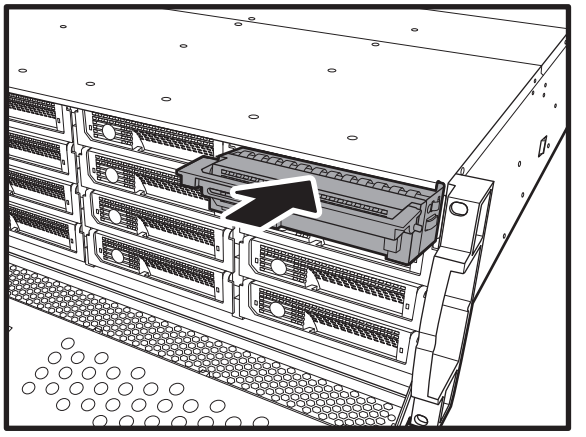


A12R-SJ / A24R-SJ

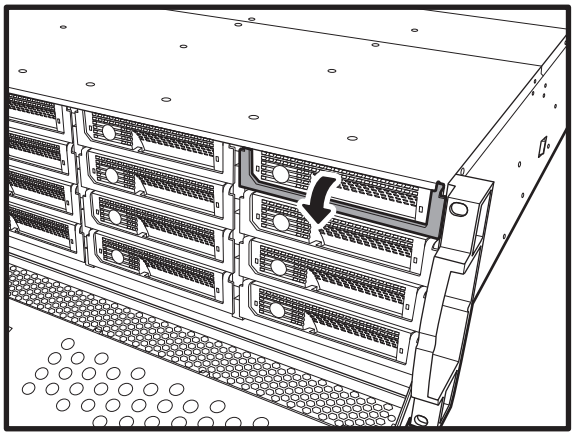
3.Pull open the front panel door.



4.Insert the hard disk tray into the empty slot.

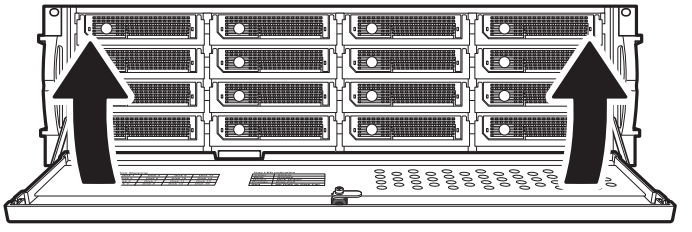


5.Push down the tray handle to secure the hard disk tray into place.



6.Repeat steps 4 to 5 until all the required disks have been installed.

7.Close the front panel door, then lock it.



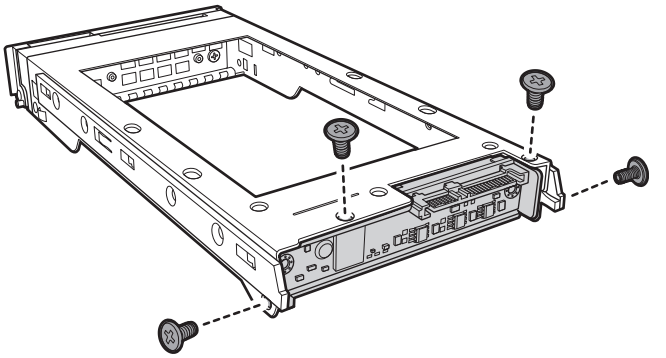
SATA hard disks

SATA hard drive installation requires an AA-MUX adapter to be installed on the hard disk tray first before installing the SATA hard disk.

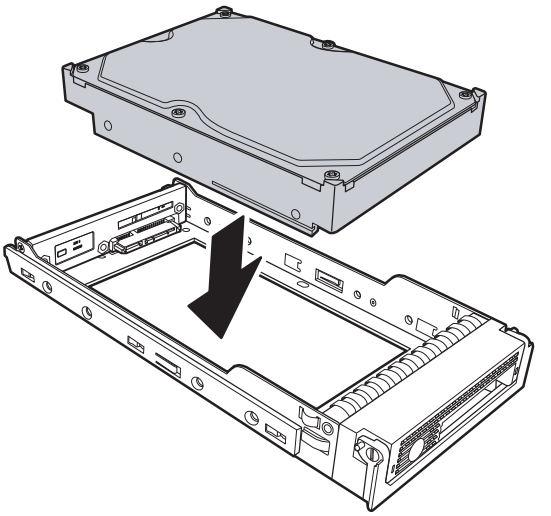
> **NOTE**
> AA-MUX is an optional accessory and is sold separately. Contact your supplier to purchase one.

Follow the procedures below to install SATA hard disks:

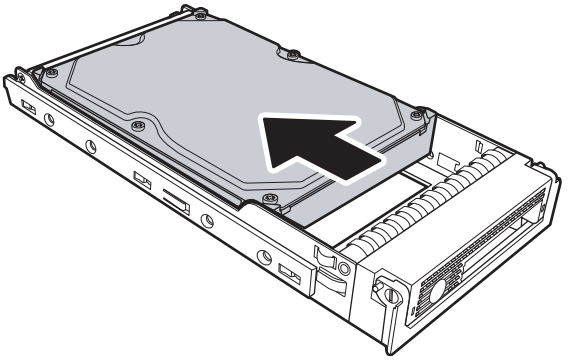
1.Place the AA-MUX adapter on the hard disk tray and attach the four screws as shown.



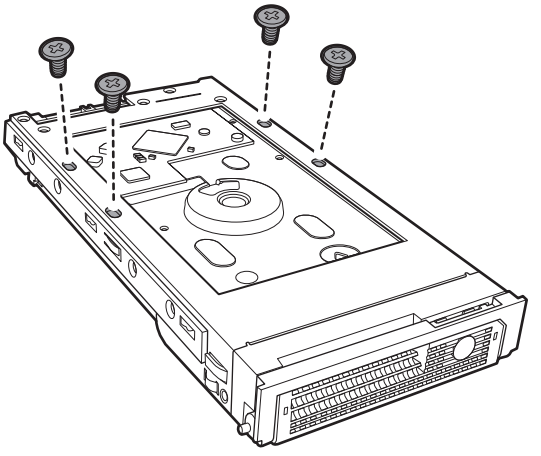
2.Place the hard disk into the hard disk tray with the drive connectors facing the AA-MUX adapter.



3.Slide the hard disk towards the AA-MUX adapter and connect the power and data connectors.

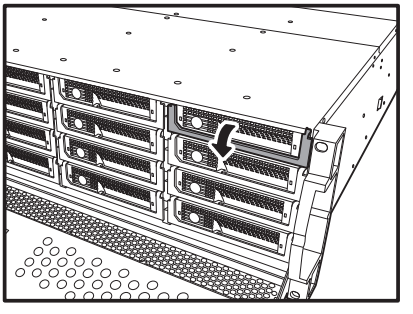


4.Attach the screws to secure the hard disk.



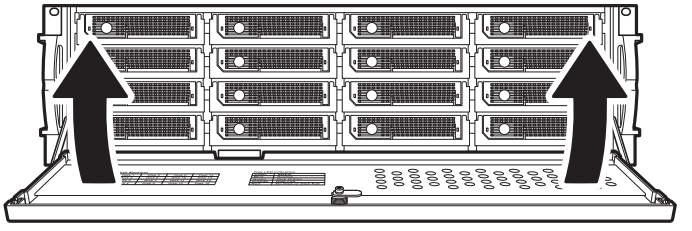
5.Insert the hard disk tray into an empty slot.

6.Push down the tray handle to secure the hard disk tray into place.



7.Repeat steps 1 to 6 until all the required disks have been installed.

8.Close the front panel door, then lock it.

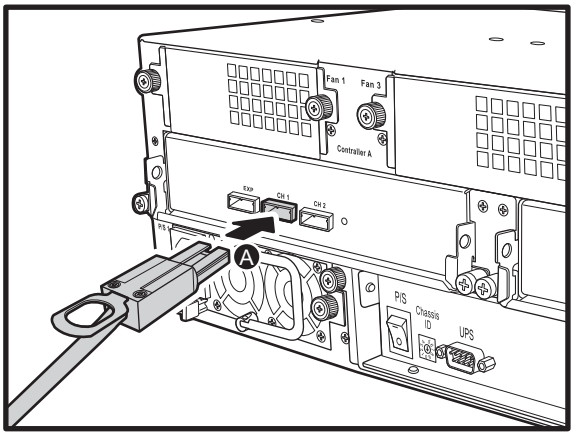


Step 4: Making Connections

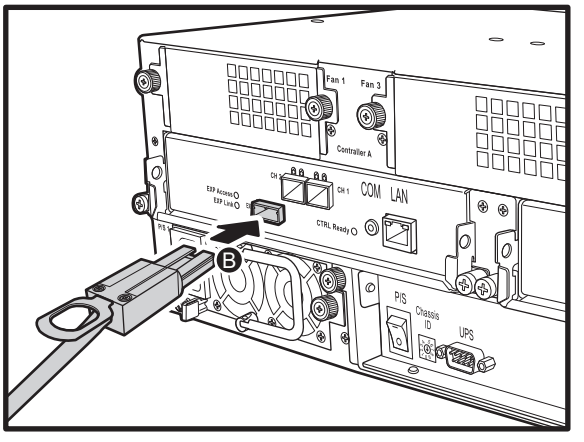
The JBOD system has two controllers, each controller has three x4 SAS ports that enables you to connect to a host computer, a RAID system or expand the JBOD enclosure.

Use a x4 SAS cable to connect the JBOD system to a host computer or to a RAID system. Follow the procedures below:

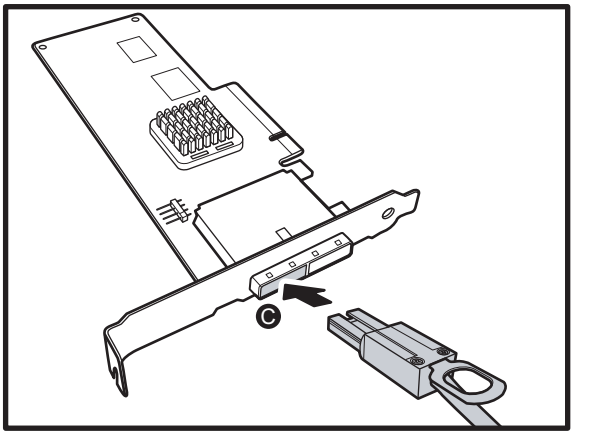
1.Insert the SAS cable into the CH1 port of A16R-SJ.



2.To connect to a RAID system, insert the other end of the SAS cable to the EXP port of the RAID system(B). Or to connect to a host server, insert the other end of the SAS cable to the HBA connector of the host server (C).



RAID system connection. A16R-FS Fibre RAID system is shown above.



HBA card of host server

NOTE

To configure, see **Step 6: Configuring the JBOD system**.

Expanding JBOD Enclosures

You can expand a maximum of seven JBOD enclosures to a RAID system. **Figure 1-1** shows a RAID system with three JBOD enclosures in a loop. The loop connection works to ensure the system can continue with its operation without interruption even if any of the JBOD fails. Once a JBOD fails, the other two can still continue to transmit data around the loop via the redundant path.

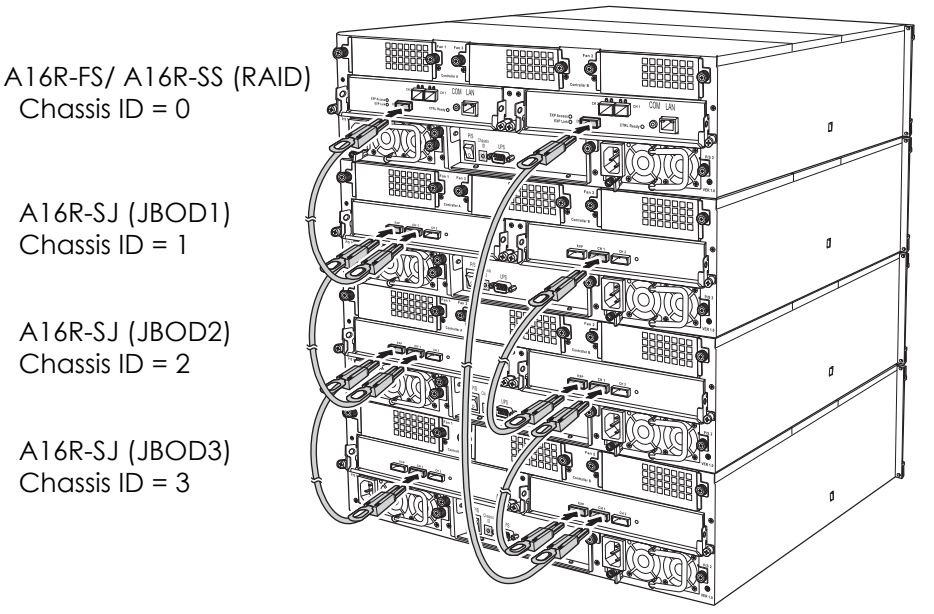


Figure 1-1 RAID system with JBOD enclosure in a loop

To establish the connection:

1.Connect the RAID system EXP port to the CH1 port of the JBOD1 using a SAS cable.

2.To connect to the next JBOD, connect the EXP port of JBOD1 to the CH1 port of JBOD2.

3.Follow the same procedures to connect the succeeding JBOD enclosures.

4.To make a loop, connect the EXP port of JBOD3 to the CH1 port of JBOD2.

5.Connect the EXP port of JBOD2 to the CH1 port of JBOD1.

6.Connect the EXP port of the RAID system to the CH1 port of JBOD3.

7.Set the chassis ID:

- A16R-FS (RAID) = 0
- A16R-SJ (JBOD1) = 1
- A16R-SJ (JBOD2) = 2
- A16R-SJ (JBOD3) = 3; and so forth for more JBOD enclosures

NOTE

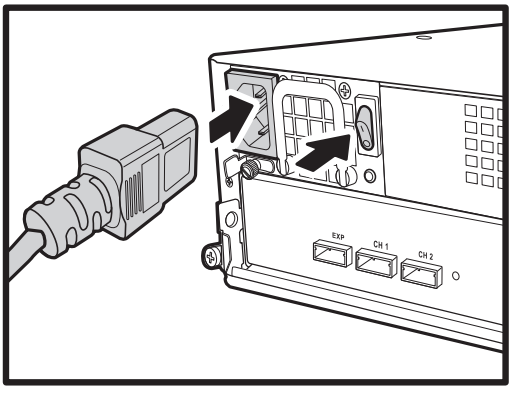
For more information, see **2.3 SAS JBOD Enclosure Display** on the Accusys RAID GUI user's manual.
To configure, see **Step 6: Configuring the JBOD system**.

Step 5: Powering on the System

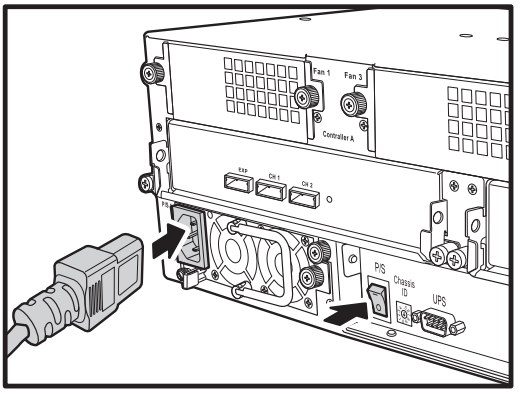
Connecting the Power

1.Plug one power cable into the AC power port.

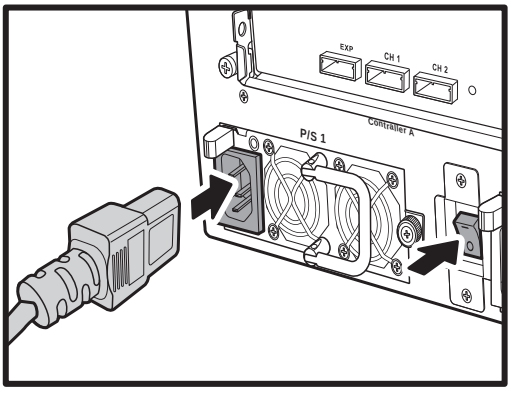
A12R/U-SJ



A16R/U-SJ



A24R/U-SJ



2.Plug the second power cable into the other AC power port.

Once all the components have been connected, the system can now be powered on using the power switch.

Power on the system in the following order:

- JBOD system(s)
- RAID system
- Host server

NOTE

Before turning the system on, make sure the **chassis ID switch** has been set properly.
When the JBOD system is successfully installed and powered on, **Power**, **Fan**, **TEMP**, and **HDD** will turn green and **IO1** and **IO2 RDY LED**s will flash green.

Step 6: Configuring the JBOD system

Configuring Host Server Connection

Figure 1-2 shows an example of two A16R-SJ connected to the host server.

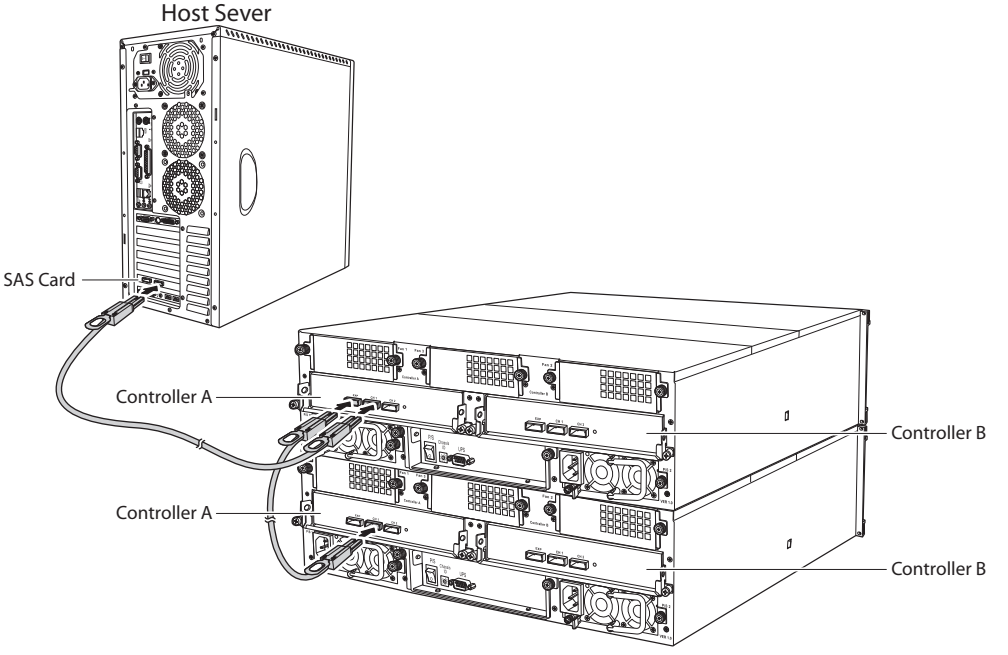


Figure 1-2 Host server connection with JBOD expansion

NOTE

The same procedures apply to A12R-SJ and A24R-SJ RAID systems when using SAS connectors.

To configure the connection using Windows, follow the procedures below:

NOTE

The following procedures are based on Windows server 2003 R2. Make sure you are installing in Windows 32-bit or 64-bit.

1.Open the folder with the installation files for Windows 32-bit or 64-bit.

2.To check the configuration, open **Computer Management** > **Device Manager**.

- Check if all the hard disk installed in the JBOD are detected.

Configuring the RAID System

Figure 1-3 shows an example of a RAID system (A16R-FS) connected to three JBODs.

> **NOTE**
> The same procedures apply to A16R-SS RAID system using SAS connectors.
> The same procedures apply when using SAS: A12R-SS / A24R-SS connectors to A12R-FS / A24R-FS RAID systems.

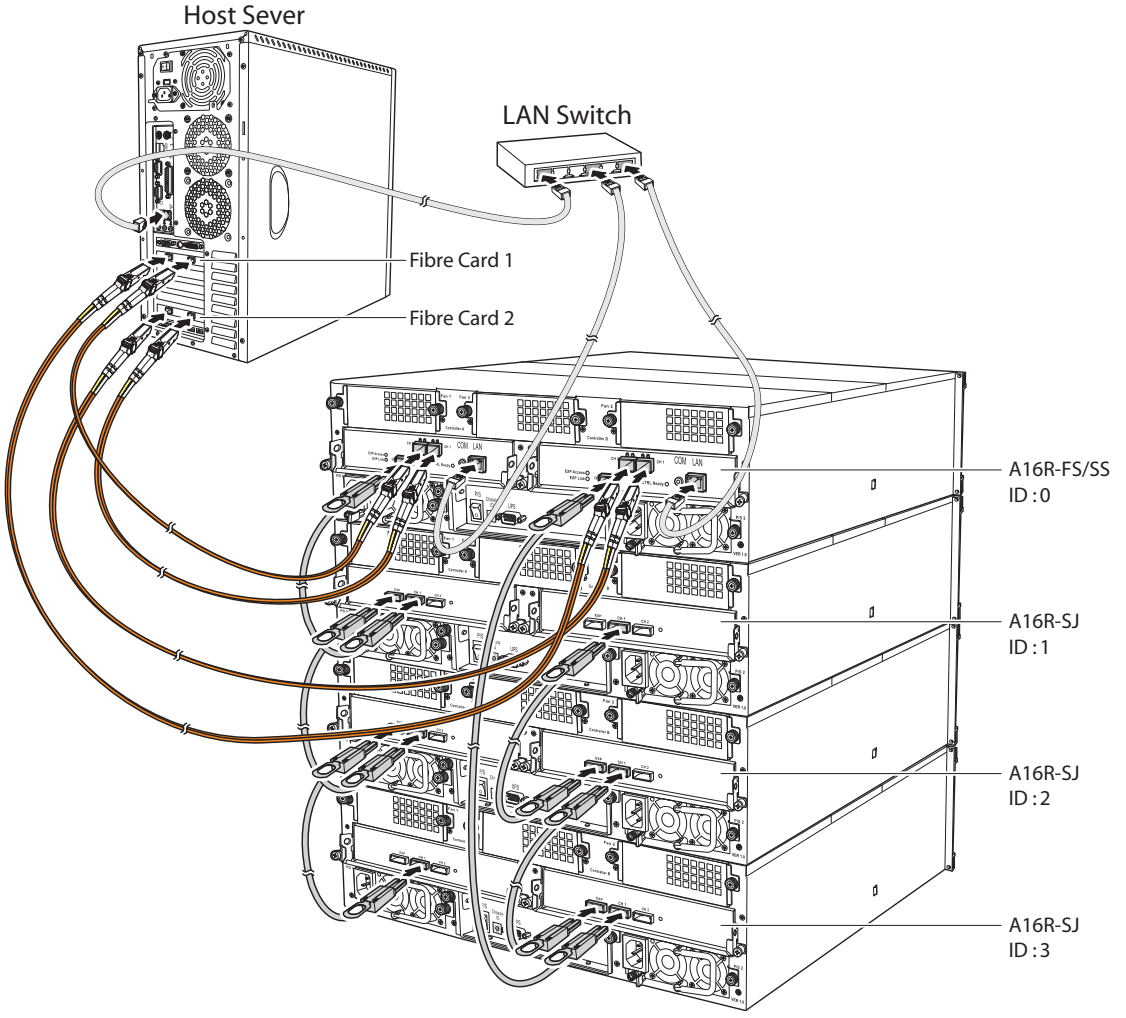


Figure 1-3 RAID system with JBOD expansion

To establish the connection, follow the procedures below:

1. Connect the RAID system and the JBOD enclusures following the procedures in**Expanding JBOD Enclosures on page 17**.
2. Connect the RAID system to the host server using fibre cables as shown.

3.Connect controller A and controller B of the RAID system to the LAN switch.

4.Connect the host server to the LAN switch.

This connection can be configured using GUI (Graphical User Interface) or CLI (Command Line Interface).

- **To configure using GUI**

The JBOD system can be detected automatically by the GUI when connected. The chassis ID corresponds to the enclosure tab number shown in the GUI. The number of enclosure tabs may vary according to the number of connected JBOD systems. The connection in **Figure 1-3** will show three JBOD enclosure tabs. The enclosure display may show empty slots depending on the number of drives installed. The following table shows the supported number of JBOD systems and hard disks.

A12R-SJ JBOD System	Memory size	Units of HDD	Number of JBOD Enclosure
12-bay	1G	64	5*
	2G or higher	120	9

* When there are 5 JBOD enclosures, the last JBOD can only contain 8 disks.

A16R-SJ JBOD System	Memory size	Units of HDD	Number of JBOD Enclosure
16-bay	1G	64	3
	2G or higher	120	7

A24R-SJ JBOD System	Memory size	Units of HDD	Number of JBOD Enclosure
24-bay	1G	64	3*
	2G or higher	120	4

* When there are 3 JBOD enclosures, the last JBOD can only contain 16 disks.

1.Connect and login to the GUI webpage.

- Login name = admin
- Password = 0000

2.Check if the status of all the hard disks are **unused**.

3.Create disk groups.

4.Create logical disks.

5.Create LUN mapping.

NOTE

For more details on GUI configuration, please see **Chapter 2 Using the RAID GUI** in the Accusys RAID GUI user's manual.

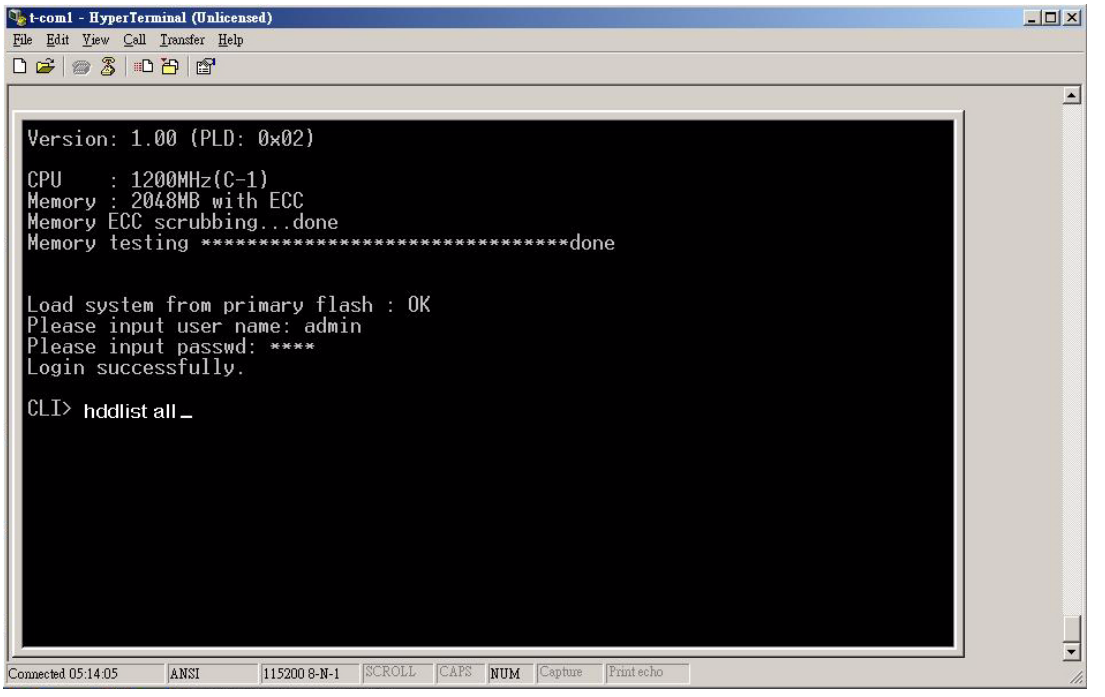
- **To configure using CLI**

The Command Line Interface (CLI) is a set of commands which allows users to configure or monitor the system by entering lines of text through a variety of terminal consoles. For more information about the CLI commands, please refer to the software manual.

To perform basic configurations, follow the steps below:

1.Login to the CLI utility.

2.Check the hard disk condition, type **hddlist all** in the command line (**CLI>**).



3.Create disk groups using the **dgcreate** command.

Command	dgcreate
Synopsis	dgcreate dg***i*** hdd**x** hdd***y*** ... [-n ***name***] [-i par/seq] [-z] [-s hdd**z**,hdd***a***, ...] [-t ***capacity***]
Description	Create a disk group with member disks.

Parameters	[-n ***name***]: the name of a disk group [-i par/seq]: logical disk initialization mode (parallel or sequential) [-z]: write-zero immediately [-s hdd***z***,hdd***a***, ...]: local spare disks [-t ***capacity***]: capacity to truncate

For example, to create disk group 0 (**DG0**), with hard disks 1 to 8 in the group, type the following in the command line:

CLI>**dgcreate dg0 hdd1 hdd2 hdd3 hdd4 hdd5 hdd6 hdd7 hdd8**

4.Create logical disks using the **ldcreate** command.

Command	ldcreate
Synopsis	ldcreate dg***x***ld***y*** ***capacity raidlevel*** [-s ***stripesize***] [-i ***initopt***] [-f ***x***] [-o ***offset***] [-n ***name***] [-c ctl***x***]
Description	Create a logical disk.
Parameters	***capacity***: logical disk capacity ***raidlevel***: raid0, raid5, raid3, raid1, raid6, raid10, or nraid [-s ***stripesize***]: stripe size [-i ***initopt***]: initialization method [-f ***x***]: free chunk [-o ***sector***]: alignment offset [-n ***name***]: the name of a logical disk [-c ctl***x***] (for redundant controller only): the preferred controller of a logical disk

For example, to create logical disk 0 (**DG0LD0**) with 1000GB capacity, using RAID level 5, type the following in the command line:

CLI>**ldcreate dg0ld0 1000gb raid5 -s 128kb -i bkg -c ctla**

5.Create LUN mapping using the **htpaddlun** command.

Command	htpaddlun
Synopsis	htpaddlun fcp***x***/sas***x*** jbd***y***/dg***y***ld***z***/vol***y***/vvol***y*** [-l lun***z***] [-s 512b/1kb/2kb/4kb] [-g ***cylinder head sector***] [-w wt/wb] htpaddlun scp***x*** jbd***y***/dg***y***ld***z***/vol***y***/vvol***y*** [-i ***scsi_id***] [-l lun***z***] [-s 512b/1kb/2kb/4kb] [-g ***cylinder head sector***] [-w wt/wb]
Description	Add a LUN in a FC port with a virtual disk.

Parameters	[-i ***scsi_id***]: SCSI ID Refer to **sgaddlun** for other parameters.

For example, to add LUN of **fcpa1** in the logical disk **DG0LD0**, type the following in the command line:

CLI>**htpaddlun fcpa1 dg0ld0**

NOTE

Make sure that all logical disk have LUN mapping.

6.Check if all logical disks have LUN mapping, type **htplistlun all** in the command line.

NOTE

For more details on CLI configuration, please see **Chapter 4 Using the CLI Commands** in the Accusys RAID GUI user's manual.

Step 7: Host Configuration

Windows Multi-Path Solution: Pathguard

Pathguard is the bundled multi-path IO solution for Windows platforms. It consists of MPIO drivers and a web-based path manager GUI that allows you to manage MPIO configurations for multiple host computers.

Windows MPIO framework requires rebooting the host computer when enabling the MPIO driver on the host computer, so that the regular disk device drivers will be replaced by the MPIO disk drivers.

Windows can properly detect multi-path disks only during MPIO driver installation, so reconfiguration, like adding/removing paths or LUNs requires you to reinstall the Pathguard MPIO driver and reboot the host computer.

- **To install Pathguard:**

1.Double click the installation files on a host computer (choose Windows 32-bit or 64-bit installation file according to your host system). Installing Pathguard will automatically install the MPIO driver.

2.Follow the installation wizard to start installation.

3.After installing **Pathguard utility**, click **Next** to continue installing the **MPIO driver**.

4.Reboot the computer to complete installation.

- **To check disk configuration:**

1.Go to **Computer Management** > **Device Manager**.

- Click **Disk Drivers**, and check for **Multi Path Disc Device**.
- Click **SCSI and RAID controller**, and check for **Multi Path Support**.

NOTE

If the two items are not found, you need to re-install **Pathguard utility**.

2.Go to **Disk Management**, and check for the two installed disk devices to indicate the system is successfully connected.

For more information about Pathguard utility and MPIO Solutions, please refer to the Accusys RAID GUI user's manual.

Step 8: Powering Off the System

Follow the procedures below to power off the system:

1.Stop all applications running in the host server.

2.Turn off the host server.

3.Close any GUI or CLI applications.

4.Power off the RAID system using the power switch.

5.Power off the JBOD system using the power switch.

CAUTION

Disconnect all AC power cords from the MAINS to completely power off the devices.

Technical Support

For access information and updates, contact our technical support team or visit our website.

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